Order Number: MOP0110005C2

Service Manual

Microwave Oven

NN-K151W

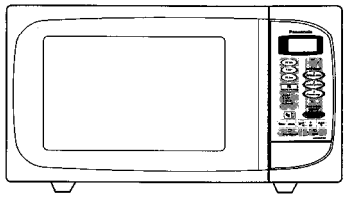
19L

White

EPG for Italy,Spain,Portugal,Greece,Eastern Europe.

GPG for Belguim,France,Finland,Denmark,Sweden, Norway.

WPG for Switzerland.



SPECIFICATIONS

Power Source	230V AC Single Phase 50Hz
Power Requirements	Max 2200W: (Microwave 1200W, Grill 1100W)
Output: (IEC705-88)	Microwave 800W (IEC-705)
Microwave Frequency	2,450 MHz
Timer	59 Min 90 Seconds
Oven Cavity Size	19L
Outside dimensions	465mm (W), X 346mm (D), X 279mm (H)
Inside Dimensions	290mm (W), X 306mm (D), X 208mm (H)
Weight	13.5 Kg
	Specifications subject to change without notice

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

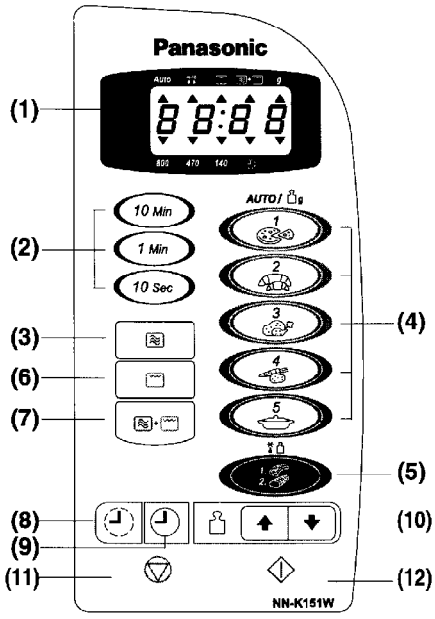
Panasonic®

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

1. Control Panel

FEATURES	NN-K151W
Microwave	4
Auto Weight Cook	3
Auto Weight Defrost	2
Stage Cooking	3 Stage
More/Less	Yes
Kg/lb.oz	Yes
Clock	24 Hrs



(1) Display Window
(2) Time Pads
(3) Microwave Power Levels
(4) Auto Weight Programs
(5) Auto Weight Defrost Pad
(6) Grill pad
(7) Combination Pad
(8) Timer Pad
(9) Clock Pad
(10) Weight Selection Pads

(11) Stop/Cancel Pad:
Before cooking: One press clears your instructions.
During cooking: one press temporarily stops the cooking program. Another press cancels all your instructions and the time of day will appear in the display.
(12) start pad

BEEP SOUND
When a pad is touched correctly a beep will be heard. If a pad is touched and no beep is heard, the unit has not or cannot accept the instruction. At the end of any complete program, the oven will beep 5 times.

2. Operating Procedure

2.1 Setting the Clock

When the oven is fist plugged in "88:88" appears in the display window
Example: to set 11:25pm.

Press Clock pad.
Display will show "24H"

Press Time pads.
Enter time of day by pressing appropriate time pads
When you press any number pads,numbers will start blinking.

Press Clock pad.
Numbers stop blinking.

2.2 Microwave Cooking and Time Defrosting

The glass turntable must always be in position when using the oven.

Wattage	
High	800 Watts
Medium	470 Watts
Simmer	140 Watts
Defrost	Cyclic

Press the pad with the power you require.

Select cooking time by pressing appropriate pads.

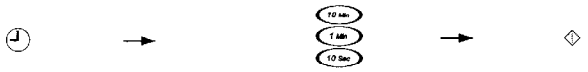
Press Start
The cooking program will start and the time in the display will count down.

CAUTION
The oven will automatically work on HIGH microwave power if a cooking time is entered without the power level previously being selected.

Multi-Stage Cooking
The oven has 3 stage memory, so you can program up to 3 different instructions and the oven will switch automatically from power to power except timer function. (Repeat steps 1 and 2 above but only press Start after all stages have been entered).

2.3 Timer

This feature operates as a minute timer without microwave energy.



Press Timer pad.

Set the time you want to count down.

Press Start

NOTE: The maximum time to delay start is 59 minutes, 90 seconds.

2.4 Auto Weight Defrost

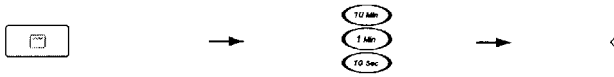
This feature allows you to defrost joints of meat and bread automatically once you have entered the weight of the food.

Select desired program.
Press the pad once to select small piece and twice to select big piece.

Set weight.
Press Up pad the window will display a weight in grams or ounces. Adjust the weight using the Up and Down pad. The weight will change in 10g or 1 oz increments.

Press Start.
Remember to stir or turn the food during defrosting.

This feature allows you to brown food quickly. The heating element is located in the top of the oven.



Press Grill pad.

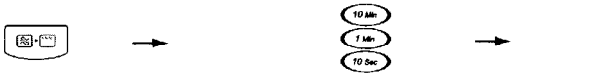
Select cooking time by pressing appropriate pads.

Press Start.
The Grill cooking will start and the time in the display will count down.

NOTE : Time can be set up to 29 minutes, 90 seconds.

2.6 Combination Cooking

This feature allows to cook food with heater and microwave at the same time.



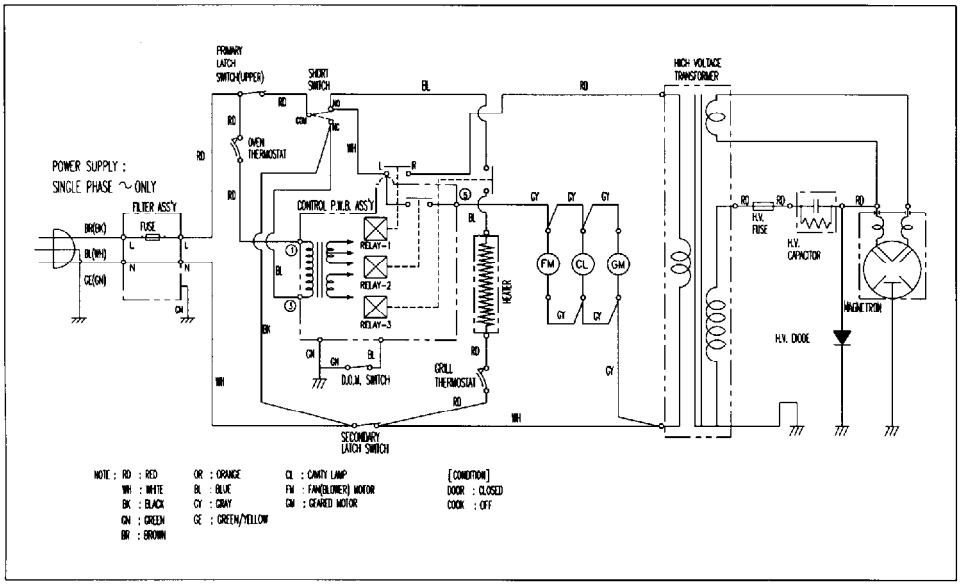
Press Combination pad.

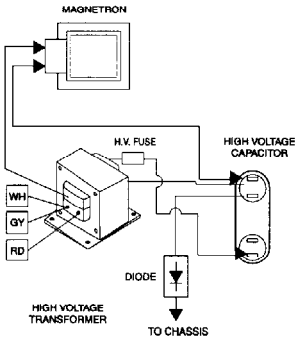
Select cooking time by pressing appropriate pads.

Press start
The combination cooking will start and the time in the display will count down.

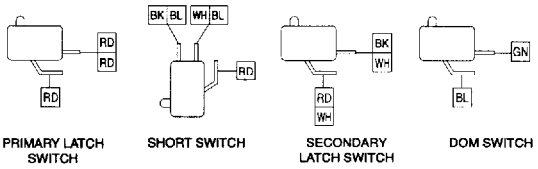
NOTE : Time can be set up to 59 minutes, 90 seconds.

3. Schematic Diagram





SYMBOL	COLOUR
BK	BLACK
GY	GRAY
GN	GREEN
RD	RED
BL	BLUE
WH	WHITE



4. Description of Operating Sequence

4.1 Variable power cooking control

The coil of power relay B(RY 1) is energized intermittently by the digital programmer circuit, when the oven is set at any power selection except for high power position. the digital programmer circuit controls the ON-OFF time of power relay B contacts in order to vary the output power of the microwave oven from "Warm" to "High" power. One complete ON and OFF cycle of power relay B is 29 seconds. The relation between indications on the control panel and the output of the microwave oven is as shown in the table.

POWER SETTING	OUTPUT POWER APPROX.	ON TIME OF POWER RELAY B ON(SEC)	OFF TIME OF POWER RELAY B OFF(SEC)
HIGH	800W	29	0
LOW	470W	17	12
WARM	140W	5	24
CYCLIC DEFROST	250W	Please refer to description of cyclic defrost	

NOTE: The ON/OFF time ratio does not correspond with the percentage of microwave power since approximately 2 seconds are required for heating of magnetron filament.

4.2 Cyclic defrost

When defrost power and defrosting time is selected and start pad is touched:

1. The digital programmer circuit (DPC) divides the total defrosting time into 5 periods, consisting of 3 defrosting periods, each followed by a standing period except last defrosting.
2. During 1st defrosting power periods, power relay B energized for 17 seconds and de-energized for 12 seconds by DPC.
3. During 2ND and LAST defrosting power periods, power relay B energized for 14 seconds and de-energized for 15 seconds by DPC.
4. During standing periods, power relay B energized for 5 seconds and de-energized for 24 seconds by DPC.

NOTE: Defrosting time selected is converted into certain percent by the DPC but the display will show selected time in minutes and seconds as programmed. The total number of seconds is divided into 5 different periods.

Example #2: If Defrosting time is selected for 10 minutes, each operating period will be as follows:

10minutes = 600seceonds, 600/100 = 6seconds(1%)

20% - 20% - 10% - 40% - 10%

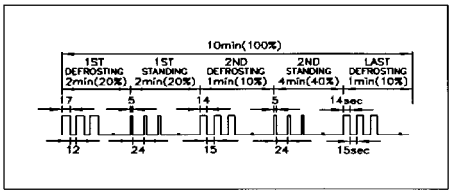
(120sec.) - (120sec.) - (60sec.) - (240sec.) - (60sec.)

(2min.) - (2min.) - (1min.) - (4min.) - (1min.)

4.3 Auto defrost, auto reheat cook control

When the auto control feature is selected and start pad is touched:

1. The digital programmer circuit determines the power level and cooking time to complete cooking and indicates the operation state in the display window. The table shows the corresponding cooking times for respective serving by categories.
2. When cooking time in the display window has elapsed, the oven turns off automatically by a control signal from the digital programmer circuit.



AUTO DEFROST

CATEGORY	WEIGHT	TOTAL DEFROSTING TIME
1.BREAD	80g	0m 40s
2. MEAT	180g	3m 54s

AUTO REHEAT

CATEGORY	WEIGHT	COOKING TIME
1. PIZZA	200g	4m 00s
2. JACKET POTATO	400g	9m 20s
3. FROCEN GRATIN	400g	15m 20s
4. REHEAT MEAL	300g	9m 00s
5. FROZEN VEG.	500g	10m 20s

4.4 Grill, combination cook control

When the grill or combination feature is selected and start pad is touched:

1. The power relay C (RY3) is energized by DPC until the cooking time ends.
2. In combination mode, power relay B (RY1) energized for 14 seconds and de-energized for 15 seconds by DPC.

5. Cautions to be Observed When Troubleshooting

Unlike many other appliances, the microwave oven is high-voltage, high-current equipment. Though it is free from danger in ordinary use, extreme care should be taken during repair.

CAUTION
Servicemen should remove their watches whenever working close to or replacing the magnetron.

5.1 Check the earthing

Do not operate on a 2-wire extension cord. The microwave oven is designed to be used in a completely earthed condition. It is imperative, therefore, to make sure it is properly earthed before beginning repair work.

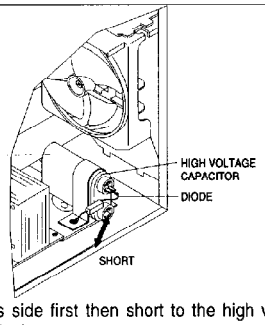
5.2 If the door lock, the door switch, the door seal or the door develops a malfunction, be sure not to operate the oven until complete repairs are made

If the oven is operated with any of these parts in imperfect condition, hazardous microwave leakage may occur.

WARNING
Never operate the oven until the following are confirmed:
- The door is tightly closed.
- There is no broken hinge or door arm.
- The door seal is not damaged.
- The door is not bent or warped.
- There is no other visible damage.

5.3 Warning about the electric charge in the high voltage capacitor

For about 30 seconds after the oven is turned off, an electric charge remains in the high voltage capacitor. When replacing or checking parts, remove the power plug from the wall outlet, wait 30 seconds and short the terminal of the high voltage capacitor (Terminal of lead wire from diode) to chassis ground with an insulated jumper lead wire or an insulated handle screw driver to discharge.



Touch chassis side first then short to the high voltage capacitor terminal

IMPORTANT NOTE
High voltage above 250 volts exists on the following parts during operation.
- Magnetron
- High Voltage Transformer
- High Voltage Diode
- High Voltage capacitor

Pay special attention during repair or troubleshooting in these areas.
If the microwave oven is operated with incorrectly installed door hinge or magnetron, it can cause microwave leakage of over 5mW/cm². Hence it is absolutely necessary to check if magnetron and door hinge are correctly and safely installed after repairs or replacement.

WARNING
Never touch any circuit wiring with your hand nor with an insulated tool during operation.

5.4 When parts must be replaced, remove the power plug from the outlet and discharge the high voltage capacitor

5.5 Confirm after repair

1. After repair or replacement of parts, make sure that the screws of the oven, etc. are neither loose nor missing. Microwaves might leak if screws are not properly tightened.
2. Make sure that all electrical connections are tight before inserting the plug into the wall outlet.

5.6 Avoid inserting nails, wire, etc. through any holes in the unit during operation

Never insert a wire, nail or any other metal object through the lamp holes on the cavity or any other holes or gaps, because such objects may work as an antenna and cause microwave leakage.

5.7

CAUTION
MICROWAVE RADIATION
Personnel should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating device if it is improperly used or connected. All input and output microwave connections waveguides, flanges and gasket must be secure. Never operate the device without a microwave energy absorbing load attached. Never look into an open waveguide or antenna while the device is energized.

5.8

CAUTION
High voltage parts may become uncovered when outer cabinet is removed.

5.1. Laitteen Huollossa Ja Korjauksessa Huomioonotettavia Varotoimenpiteitä

Toisen kuin monet muut kodinkoneet, mikroaaltouuni toimii korkealla jännitteellä ja suurella virralla. Vaikka uuni onkin täysin turvallinen normaalikäytössä, sen korjauksessa on noudatettava ehdotonta varovaisuutta.

HUOMIO

Magnetronia vaihdettaessa ja sen läheisyydessä työskenneltäessä on riisuttava rannekello.

5.1 Maadoituksen tarkistaminen

Älä käytä kaksijohtimista jatkojohtoa. Mikroaaltouuni on tarkoitettu käytettäväksi maadoitettuna. Sen vuoksi on erittäin tärkeää, että maadoitus tarkistetaan ennen korjaustöiden aloittamista.

5.2 Jos uunin oven lukkoon, sen kytkimeen tai tiivisteisiin tai itse oveen tulee jokin vika, ei uunia saa käyttää ennenkuin vika on korjattu

Jos uunia käytetään oven tai sen jonkin osan ollessa vioittunut, saattaa tapahtua vaarallista mikroaaltovuotoa.

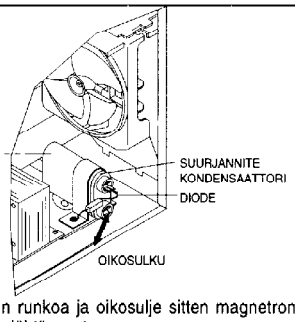
VAROITUS

Ennen uunin käynnistämistä on aina ensin tarkistettava että:

- Uunin ovi on suljettu kunnolla.
- Oven tiivistyslistat eivät ole vahingoittuneet.
- Ovi ei ole vino, vääntynyt tai epätiivis.
- Oven saranat ovat ehjät.
- Ettei uuni ole mitenkään näkyvästi vaurioitunut.

5.3 Huom! Sähkö varautuu korkeajännitekondensaattoriin

Kun uuni on kytketty OFF-asentoon jää sähkövaraus korkeajännitekondensaattoriin noin 30:neksi sekunnksi. Kun asennat tai tarkistat uunin osia kytke uuni OFF-asentoon, odota 30 sekuntia ja oikosulje korkeajännitekondensaattorin kosketin (Diodin liitosjohtimen pääte) kojeiston runkoa vasten eristetyllä "hyppylangalla".



Kosketa ensin runkoa ja oikosulje sitten magnetronin hehkunapojen lähtönavat.

TÄRKEÄ HUOMAUTUS **KORKEA JÄNNITE**

Seuraavien osien jännite voi olla yli 250 volttia laitetta käytettäessä:

- Magnetroni
- Korkeajännitemuuntaja (sijaitsee muuntimessa [U])
- Korkeajännitediodit (sijaitsevat muuntimessa [U])
- Korkeajännitekondensaattorit (sijaitsevat muuntimessa [U]).

Kiinnitä erityistä huomiota näihin osiin.

Jos laitetta käytetään, kun oven saranat tai magnetroni on kiinnitetty virheellisesti, laitteen mikroaaltovuoto voi olla yli 5mW/cm 3 . Korjauksen ja vaihdon jälkeen on ehdottomasti tarkistettava, että magnetroni ja oven saranat on kiinnitetty asianmukaisesti.

VAROITUS

Kytkentäjohtoja ei saa koskettaa käytön aikana käsin eikä eristyskahvalla varustetulla ruuviavaimella.

5.4 Kun laitteeseen vaihdetaan osia on virtajohdin aina irroitettava seinästä ja korkeajännitekondensaattorien jännite purettava

5.5 Tarkistustoimet huollon jälkeen

1. Kun olet korjannut tai vaihtanut laitteen osia, varmista, että uunin ruuvit ja muut osat ovat paikoillaan ja asianmukaisesti kiristettyinä. Uunista voi vuotaa mikroaaltoja, jos ruuveja ei kiristetä asianmukaisesti.
2. Varmista ennen pistokkeen työntämistä pistorasiaan, että kaikki sähköliitännät on kiristetty asianmukaisesti.

5.6 Laitteen aukkoihin ei saa työntää nauloja, johtoja eikä muita esineitä käytön aikana

Älä koskaan työnnä johtoa, naulaa tai muuta metalliesinettä laitteen lampulle tarkoitettuihin tai muihin aukkoihin tai rakoihin.

Tällaiset esineet voivat toimia antenneina ja aiheuttaa mikroaaltovuodon.

5.7

MIKROAALTOSÄTEILYÄ

Käyttäjä ei saa joutua alttiiksi mikroaaltoenergialle, jota voi säteillä magnetronista tai muusta mikroaaltoja kehittävästä laitteesta, jos sitä käytetään väärin tai jos se kytketään väärin.

Kaikkien mikroaaltoiltäntöjen sekä syöttö-että ulostulopuolella, aaltoputkien laippojen ja tiivisteiden tulee olla varmistettuja. Mikroaaltouunia ei koskaan saa käyttää ilman kuormaa jossa mikroaaltoenergiaa kuluu. Avoimeen aaltoputkeen tai antenniin ei koskaan saa katsoa virran ollessa kytkettynä.

5.8

VAROITUS

Irroitettaessa uunin kotelo paljastuu osia joissa on korkea jännite.

5.2. Sikkerhetstiltak Ved Feilsøking

I motsetning til mange andre husholdningsapparater er mikrobølgeovnen et apparat med høy spenning og sterk strøm. Selv om den er ufarlig i normalt bruk må du være ytterst forsiktig ved reparasjonsarbeid.

FORSIKTIG

Reparatører må ta av seg armbåndsur når de arbeider i nærheten av magnetronen, eller skifter den ut.

5.1 Kontroll av jording

Må ikke brukes med totråds skjøteledning. Mikrobølgeovnen er laget slik at den skal jordes. Det er derfor ytterst viktig at du passer på at den er ordentlig jordet før reparasjonsarbeidet påbegynnes.

5.2 Om det finnes feil på dørlas, dørbryter eller døretning må ikke ovnen brukes før feilen er rettet. I motsatt fall kan mikrobølgelekkasje oppsto

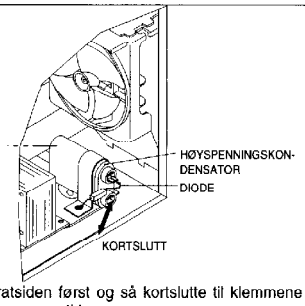
ADVARSEL

Bruk aldri ovnen før følgende er kontrollert:

- Døren er ordentlig stengt.
- Døretningslisten ikke er skadet.
- Døren er skjev, bøyd eller utett.
- Gangjernene er hele.
- At det ikke er annen synlig skade.

5.3 Advarsel vedrørende elektrisk ladning i høyspenning kondensatoren

Ca. 30 sekunder etter at ovnen er slått av, vil det fortsatt være igjen en elektrisk ladning i høyspenning kondensatoren. Ved kontroll eller skifting av deler, sla av ovnen, vent 30 sekunder og kortslutt høyspenning kondensatoren (Sammenkoblingspunkt for ledning fra dioden) til chassis med en isolert ledning som vist på Fig 15.



Berør apparatsiden først og så kortslutte til klemmene på magnetron apparatklemmen.

VIKTIG MERKNAD OM NY HØYSPENNING.

Følgende komponenter har potensialer over 250 V mens apparatet er i bruk.

- Magnetron
- Høyspentomformer (transformator) (finnes på vekselretteren (U))
- Høyspent dioder (finnes på vekselretteren (U))
- Høyspentkondensatorer (finnes på vekselretteren (U))

Vær spesielt nøye med disse områdene.
Når apparatet brukes med dørhengsler eller magnetron feil montert kan mikrobølgelekkasjen nå over 5 mW/cm^3.
Etter reparasjon eller utskifting er det svært viktig å kontrollere at magnetronen og dørhengslene er riktig montert.

FORSIKTIG

Vær forsiktig når du pakker ut, installerer eller flytter apparatet, da noen kanter er svært skarpe og kan forårsake skade hvis du ikke håndterer det forsiktig.

5.4 Ved utskifting av deler, fjern alltid støpslet fra kontakten og kortslutt høyspenningskondensatorene

5.5 Bekreft etter reparasjon

1. Etter reparasjon eller utskiftning av deler skal du passe på at skruene på ovnen osv. ikke er løse eller mangler. Mikrobølger kan lekke ut dersom skruene ikke er skikkelig strammet til.
2. Pass på at alle elektriske koplinger er stramme før du setter støpselet inn i kontakten.

5.6 Unngå å sette spiker, tråd osv. inn gjennom noen av hullene i apparatet mens det er i bruk

Sett aldri tråd, spiker eller noe annen metallgjenstand gjennom lampehullene i hulrommet eller andre huller eller åpninger, fordi slike gjenstander kan virke som en antenne og forårsake lekkasje av mikrobølger.

5.7

ADVARSEL MOT MIKROBØLGESTRALING

Personer må aldri utsettes for straling av mikrobølgeenergi.
Alle tilkoblinger for mikrobølger, som flenser og tetninger må være sikkerhetsmessig betryggende utført. Start aldri apparatet uten mikrobølgeabsorbende belastning.
Mikrobølgestråling fra åpen bølgeleder eller antenne har så stor strålingstet thet at det er stor risiko for skadevirkninger.

5.8

ADVARSEL

Når ytterdekslet fjernes blir høyspenningsførende deler tilgjengelige.

5.3. Sikkerhedsforskrifter, Der Skal Overholdes Ved Fejlfinding

I modsætning til mange andre elektriske apparater er en mikrobølgeovn udstyr, der arbejder ved et højt spændings- og strømniveau. Selv om mikrobølgeovnen er fuldstændig sikker ved normal brug, skal reparation foretages med største forsigtighed.

FORSIGTIG

Montører bør tage deres armbåndsur af, når de skal arbejde i nærheden af magnetronen eller udskifte denne.

5.1 Kontrol af jordforbindelse

Tilslut ikke ovnen ved hjælp af en 2-leder forlængerledning. Mikrobølgeovnen er konstrueret til at arbejde med jordforbindelse. Se derfor efter, at ovnen er forsvarligt forbundet til jord, før reparationen påbegyndes.

5.2 Hvis der er fejl ved låsen til ovndøren, omskifteren for døren eller tætningen af døren, må ovnen ikke anvendes, før fejlen er afhjulpet

Hvis ovnen bruges, uden at sådanne fejl er afhjulpet, er der risiko for udstråling af mikrobølger.

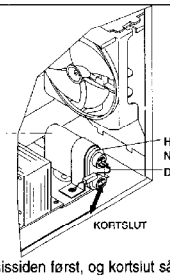
ADVARSEL

Tænd aldrig for ovnen, før De har kontrolleret, at

- Døren er forsvarligt lukket,
- Tætningslisten omkring døren ikke er beskadiget,
- Ovndøren ikke er skæv, bøjet eller utæt,
- Hængslerne er hele, og
- Der ikke findes andre synlige beskadigelser.

5.3 Advarsel om opladning af højspændingskondensatoren

Indtil omkring 30 sekunder efter at ovnen er afbrudt, vil højspændingskondensatoren stadig være opladet. Afbryd ovnen, når De skal udskifte eller kontrollere komponenter, vent 30 sekunder og kortslut højspændingskondensatorens ene tilslutning (Tilslutning for ledning fra dioden) til chassiset med et isoleret stykke ledning.



Berør chassissiden først, og kortslut så til magnetronfilamentets klemme.

VIGTIGT NY HØJSPÆNDING.

Følgende komponenter bærer højspænding over 250 volt under drift.

- Magnetron
- Højspændingstransformer (sidder på vekselretteren (U))
- Højspændingsdioder (sidder på vekselretteren (U))
- Højspændingskondensatorer (sidder på vekselretteren (U))

Der bør udvises ekstra opmærksomhed på disse steder ved reparation/fejlfinding.

Hvis ovnen betjenes med forkert monterede dørhængsler eller magnetron, vil der være risiko for mikrobølgelækager på over 5 mW/cm². Det er derfor bydende nødvendigt at kontrollere, om magnetronen og dørhængslerne er monteret korrekt efter endt reparation eller udskiftning.

ADVARSEL

Kredsløbene må ikke berøres med hånden eller et isoleret værktøj, mens ovnen er i gang.

5.4 Hvis det er nødvendigt at udskifte komponenter, skal De altid fjerne netstikket fra stikkontakten og aflade højspændingskondensatorerne

5.5 Kontrol efter reparation

1. Efter reparation eller udskiftning af komponenter, skal du se efter, at alle ovnens skruer osv. er på plads og fastspændt. Der kan opstå lækage af mikrobølger, hvis skruerne ikke er forsvarligt strammede.
2. Se efter, at alle elektriske forbindelser er strammet til, før stikket sættes i stikkontakten.

.6 Undgå at stikke søm, ståltråd o.l. gennem hullerne i enheden, mens der er tændt for den

Der må aldrig stikkes ståltråd, søm eller andre metalgenstande i lampehullerne eller andre huller eller åbninger, fordi sådanne genstande kan virke som antenner og forårsage mikrobølgelækager.

5.7

FORSIGTIG

MIKROBØLGEUDSTRÅLING

Personer må ikke udsættes for mikrobølgeenergi, som kan udstråles fra magnetronen eller andre mikrobølgegenerator, hvis den er forkert anvendt eller forbundet. Alle mikrobølgeforbindelser, bølgeledere, flanger og pakninger skal være sikre. Tilsut aldrig apparatet uden en belastning, som kan absorbere mikrobølgeenergi. Se aldrig ind i en åben bølgeleder eller antenne, mens apparet er i gang.

Mikrobølgestrålingen fra en åben bølgeleder eller antenne har så stor intensitet, at der er overhængende risiko for skader.

5.8

ADVARSEL

Når apparatets kabinet aftages, bliver der adgang til dele med højspænding.

5.4. Säkerhetsätgärder Vid Felsökning

Till skillnad från många andra apparater förekommer det hög strömstyrka och höga spänningar i mikrovågsugnar. Ugnen är helt säker vid vanligt bruk, men vid reparation måste största försiktighet iakttagas.

FÖRSIKTIGHET
Vid reparation i närheten av magnetronen eller vid byte av magnetron skall armbandsur avtagas.

5.1 Kontrollera jordningen

Använd inte förlängningskabel med bara två ledare.
Mikrovågsugnen är avsedd att användas jordad. Det är därför viktigt att se till att ugnen är ordentligt jordad innan reparationsarbetet påbörjas.

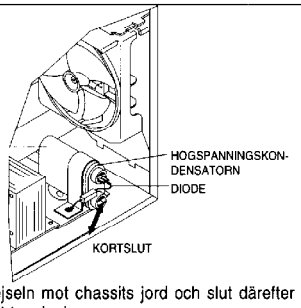
5.2 Om dörrlåset, dörromkopplaren eller dörrtillslutningen visar någon felaktighet, använd ej ugnen innan felet är avhjälpt

Om ugnen används när något av dessa fel har uppstått kan ev. Mikrovågsläckage uppstå.

VARNING
Sätt aldrig på ugnen innan följande har kontrollerats:
- Dörren är ordentligt stängd.
- Dörrtätningslisten inte är skadad.
- Dörren är skev, böjd eller otät.
- Gångjärnen är hela.
- Att annan synlig skada inte finns.

5.3 Varning för elektrisk ström i högspänningskondensatorn

CA: 30 sekunder efter det att ugnen stängts av, kvarstär en elektrisk laddning i högspänningskondensatorn. Vid utbyte eller kontroll av delar, stäng av ugnen, vänta i 30 sekunder och kortslut därefter kondensatorn (Anslutningen för ledning från dioden) till ytter höljets jord genom att använda en isolerad kortslutningsskabel.



Sätt skruvmejseln mot chassits jord och slut därefter kretsen mot ut-terminalerna

VIKTIGT **NY HÖGSPÄNNING**
Följande komponenter har spänningar på över 250V medan ugnen är i bruk.
- Magnetronen
- Högspänningstransformatorn (på omvandlaren) (U))
- Högspänningsdioderna (på omvandlaren) (U))
- Högspänningskondensatorerna (på omvandlaren) (U))

Var särskilt försiktig med de områdena.
Om ugnen används med luckans gångjärn eller magnetronen felaktigt monterade kan mikrovågsläckaget överstiga 5mW/ cm^3 . Det är mycket viktigt att kontrollera att magnetronen och gångjärnen är rätt monterade efter reparation eller byte.

VARNING
Vidrör aldrig några strömförande delar med handen eller med ett icke isolerat verktyg under arbetet!

5.4 Vid byte av delar, tag alltid ur nätkontakten från vägguttaget Högspänningskondensatorerna

5.5 Kontroll efter reparation

1. Kontrollera efter reparation eller byte av delarna att skruvar etc. på ugnen inte sitter löst eller saknas. Det kan läcka ut mikrovågor om skruvarna inte är ordentligt åtdragna.
2. Se till att alla elektriska anslutningar är ordentligt gjorda innan du sätter i kontakten i vägguttaget.

5.6 Stick inte in några spikar, trådar etc i hålen i enheten när den är i bruk

Stick aldrig in någon tråd, spik eller annat metallföremål genom lamphålen i ugnsutrymmet eller i några andra hål eller springor. Sådana föremål kan fungera som antenn och orsaka mikrovågsläckage.

5.7

VARNI NG för MIKROVÅGSSTRÅLNING
Mikrovågsenergi kan stråla från magnetronen eller från annan mikrovågsgenererande anordning om den används eller ansluts felaktigt. Alla anslutningar för mikrovåg, såsom flänsar och tätningar måste vara betryggande ur säkerhetssynpunkt.
Starta aldrig anordningen utan mikrovågsabsorberande belastning. Mikrovågsstrålning från en öppen vågledare eller antenn har sådan strålningstäthet att uppenbar skaderisk föreligger.

5.8

VARNING
Vid avlägsnande av apparatens ytterhölje frilåggs högspänningsförande delar.

6. Parts Replacement Procedure

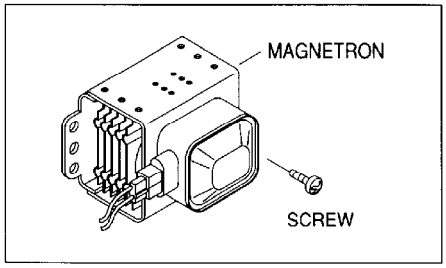
6.1 Magnetron

1. Discharge the high voltage capacitor.
2. Disconnect 2 high voltage lead wires from the magnetron filament terminals.
3. Remove 1 screw holding the magnetron.

NOTE: After replacement of the magnetron, tighten mounting screws properly making sure there is no gap between the waveguide and the magnetron to prevent microwave leakage.

CAUTION

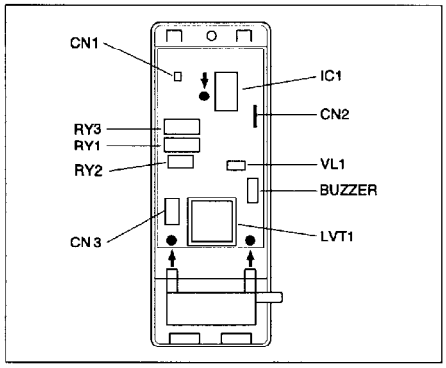
When replacing the magnetron, be sure the antenna gasket is in place.



6.2 Digital Programmer Circuit (DPC) and membrane keyboard

NOTE: Be sure to ground any static electric charge built up on your body before handling the DPC.

1. Disconnect all electrical connectors to the DPC.
2. Remove 2 screws holding escutcheon base and membrane earth tail to oven chassis and slide the escutcheon base upward slightly.
3. Release CN2 connector's lock of the DPC by pushing both levers from inside and pull them upward, then remove the flat cable of the membrane keyboard.
4. Remove 3 screws holding the DPC.



To replace membrane switch keyboard

1. Push the upper part of the keyboard (display window portion) from the back of the escutcheon base and peel off the membrane keyboard completely from the escutcheon base.

NOTE 1: The membrane keyboard is attached to the escutcheon base with double sided adhesive tape.
Therefore, applying hot air e.g. using a hair dryer is recommended for smoother removal.

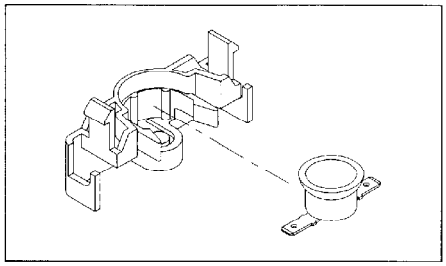
NOTE 2: When installing new membrane keyboard, make sure that the surface of the escutcheon base is cleaned sufficiently so that any problems (shorted contacts or uneven surface) can be avoided.

NOTE 3: Alignment position of membrane keyboard and escutcheon sheet are as follows:
Membrane keyboard: Right and lower edges,
Escutcheon sheet: Right and lower edges.

6.3 Low voltage transformer and/or power relays

NOTE: Be sure to ground any static electric charge built up on your body before handling the DPC.

1. Using solder wick or a desoldering tool and 30W soldering iron, carefully remove all solder from the terminal pins of the low voltage transformer and/or power relays.



NOTE: Do not use a soldering iron or desoldering tool of more than 30 watts on DPC contacts.

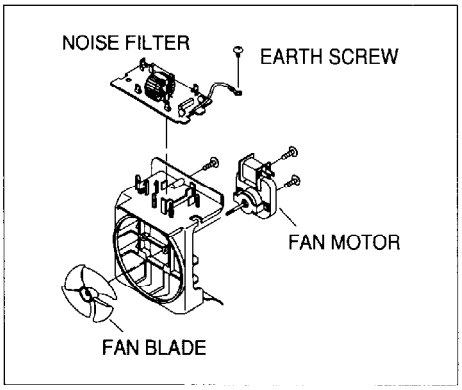
2. With all the terminal pins cleaned and separated from DPC contacts, remove the defective transformer/power relays and install new transformer/power relays making sure all terminal pins are inserted completely. Resolder all terminal contacts carefully.

6.4 Oven thermostat

1. Disconnect 2 lead wires from oven thermostat
2. Draw froward the oven thermostat

6.5 Fan motor

1. Disconnect 2 lead wires from fan motor terminals.
2. Remove a screw holding earth of noise filter.
3. Remove a screw which secure the wind guide assembly.
4. Draw forward the wind guide assembly.
5. Remove fan blade from the fan moter shaft by pulling it straight out
6. Remove two screws which secure the fan motor



6.6 Door disassembly

1. Remove door C from door E by inserting a flat blade screwdriver between them.

NOTE: Door C is attached to door E by catch hooks. Care should be taken not to damage them when removing.

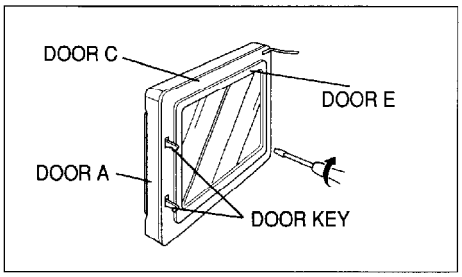
2. Separate door A from door E and releasing from catch hooks using flat bladed screwdriver.

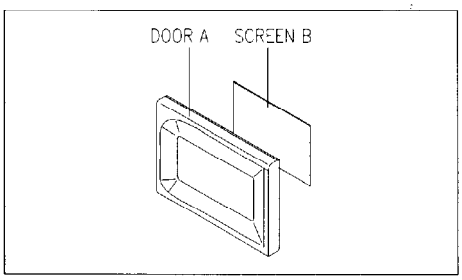
NOTE: Care should be taken to avoid damage to catch hooks during removal.

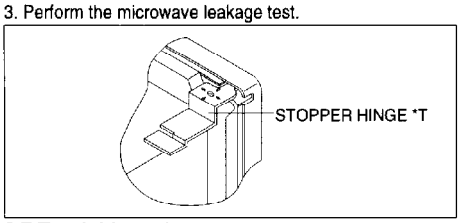
3. Separate door screen B from door A
4. Remove door key and door key spring.

After replacement of the defective component parts of the door, reassemble it and follow the instructions below for proper installation and adjustment so as to prevent an excessive microwave leakage.

1. When mounting the door to the oven, be sure to adjust the door parallel to the bottom line of the oven face plate by moving the upper hinge and lower hinge in the direction necessary for proper alignment.
2. Adjust so that the door has no play between the inner door surface and oven front surface. If the door assembly is not mounted properly, microwave power may leak from the clearance between the door and oven.
3. Perform the microwave leakage test.







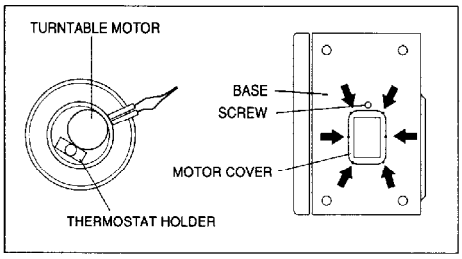
6.7 Turntable motor

1. Remove the motor cover by breaking off at the 6 spots indicated by arrows with a cutter or similar tool.

NOTE: After breaking off the motor cover, make sure that cut-off portions are properly trimmed off or bend to inside so that no sharp edge will expose to outside.

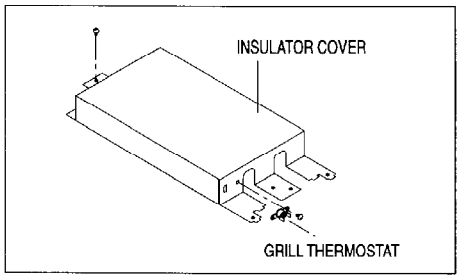
2. Disconnect 2 lead wires connected to the turntable motor.
3. Remove the turntable motor by removing 1 screw.

NOTE: To reinstall the motor cover, use 4x6 screw.



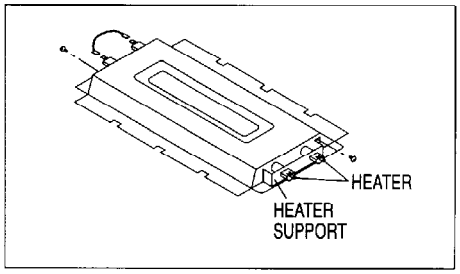
6.8 Grill thermostat

1. Disconnect 2 lead wires from grill thermostat.
2. Remove a screw holding grill thermostat.



6.9 Quartz heater

1. Disconnect 3 lead wires from heater terminals
2. Remove a screw and an insulator cover
3. Remove 2 screws holding heater support
4. Remove the heater by pulling it out



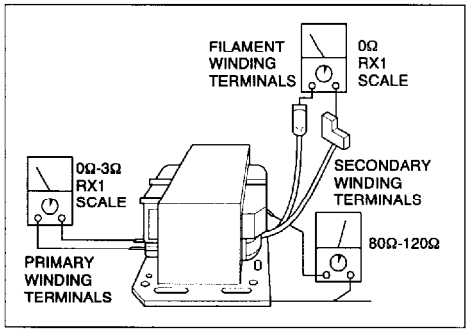
7. Component Test Procedure

CAUTION

1. High voltage is present at the high voltage terminal of the high voltage transformer during any cook cycle.
2. It is neither necessary nor advisable to attempt measurement of the high voltage.
3. Before touching any oven components, or wiring, always unplug the oven from its power source and discharge the high voltage capacitor.

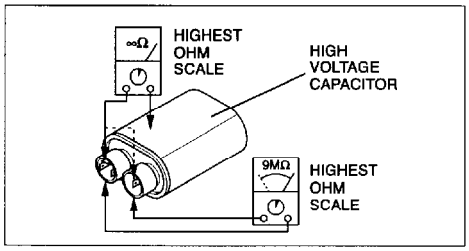
7.1 High voltage transformer

1. Remove connections from the transformer terminals and check continuity.
2. Normal continuity readings should be as follows.
   Secondary winding ..... Approx. 120 Ω -160 Ω
   Filament winding ..... Approx. 0 Ω
   Primary winding ..... Approx.1 Ω - 4 Ω



7.2 High voltage capacitor

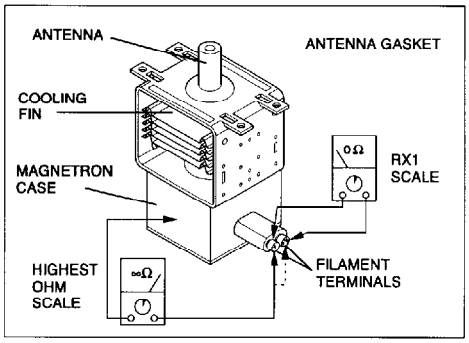
1. Check continuity of capacitor with meter on highest OHM scale.
2. A normal capacitor will show continuity for a short time, and then indicate about 10MΩ once the capacitor is charged.
3. A shorted capacitor will show continuous continuity.
4. An open capacitor will show constant about 10MΩ
5. Resistance between each terminal and chassis should be infinite.



7.3 Magnetron

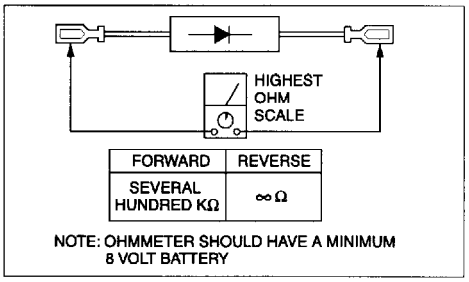
Continuity checks can only indicate an open filament or a shorted magnetron. To diagnose for an open filament or shorted magnetron.

1. Isolate magnetron from the circuit by disconnecting the leads.
2. A continuity check across magnetron filament terminals should indicate one ohm or less.
3. A continuity check between each filament terminal and magnetron case should read open.



7.4 Diode

1. Isolate the diode from the circuit by disconnecting the leads.
2. With the ohmmeter set the highest resistance scale, measure the resistance across the diode terminals. Reverse the meter leads and again observe the resistance reading.
   Meter with 6V, 9V or higher voltage batteries should be used to check the front to back resistance of the diode, otherwise an infinite resistance may be read in both directions. A normal diode's resistance will be infinite in one direction and several hundred KΩ in the other direction.



7.5 Membrane keyboard

Check continuity between switch terminals, by tapping an appropriate pad on the keyboard. The contacts assignment of the respective pads on the keyboard is as shown in digital programmer circuit (schematic).

7.6 Oven thermostat

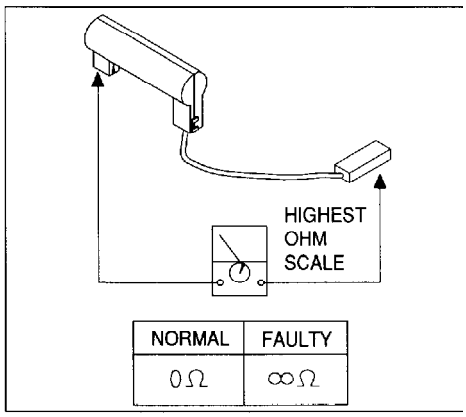
An oven thermostat is mounted on bottom of the oven cavity at the center. Its purpose is to automatically shut off the oven in case the cavity overheats for any reason.

The thermal protector will operate at 167˚F(75˚C).

When the thermal protector exceeds its temperature it will turn off the power to oven cavity and display will go to reset mode. The cooking program can be reset after cool-down.

7.7 HV Fuse

1. Isolate the HV Fuse assembly from the circuit by disconnecting its leads.
2. With the ohmmeter set at the highest resistance scale, measure the resistance across the HV fuse terminals.
   A normal HV fuse resistance will be 0Ω
   It is faulty if it shows ∞Ω



8. Measurements and Adjustments

8.1 Installation of primary latch switch, secondary latch switch and short switch

1. When mounting primary latch switch, secondary latch switch and short switch to door hook assembly, mount the primary latch switch, the secondary latch switch and the short switch to the door hook assembly as shown in the illustration.

NOTE: No specific adjustment during installation of primary latch switch, secondary latch switch and short switch to the door hook is necessary.

8.2 Measurement of microwave output

The output power of the magnetron can be determined by performing IEC standard test procedures. However, due to the complexity of IEC test procedures, it is recommended to test the magnetron using the simple method outlined below.

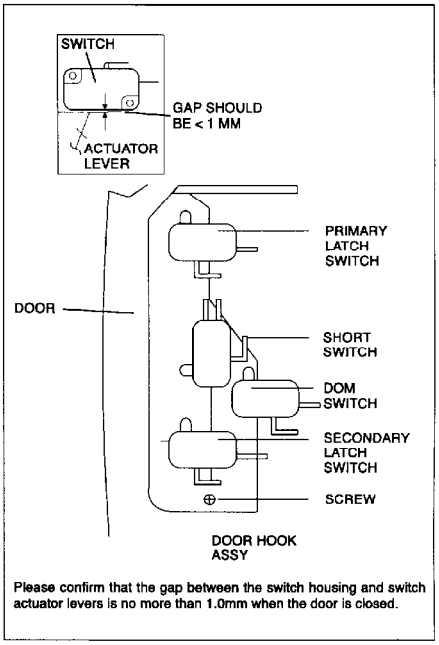
Necessary equipment:

- 1 litre beaker
- Glass thermometer
- Wrist watch or stopwatch.

NOTE: Check the line voltage under load to ensure it meets specifications. Low voltage will cause reduction in the magnetron output. Temperature readings and heating time should be as accurate as possible.

Output power performance test procedure

1. Fill the beaker with exactly one litre of tap water. Stir the water using the thermometer and note the temperature (record as T1)
2. Place the beaker on the centre of glass cook plate.
3. Set to high power and heat for exactly one minute.
4. Stir the water again with the thermometer and note the temperature (record as T2).
5. The normal temperature rise (T1-T2), should be more than 7.0˚C using the high power selection with the oven operating at specified line voltage.



Please confirm that the gap between the switch housing and switch actuator levers is no more than 1.0mm when the door is closed.

9. Troubleshooting Guide

CAUTION

1. Check the unit is grounded before commencing any troubleshooting.
2. Do not take measurements in the high voltage circuit.
3. Discharge the high voltage capacitor.
4. When checking the continuity of the switches or the high voltage transformer, disconnect one lead wire from these parts and then check continuity with the AC plug removed. To do otherwise may result in a false reading or damage to your meter.
5. Do not touch any parts of the circuitry on the digital programmer circuit, since static electric discharge may damage this control panel. Always connect yourself to ground to discharge any static from your body.
   Ensure you are touching the ground while working on this panel to dischage any static charge in your body.
6. 230VAC is present in the shaded area of the digital programmer circuit board (Terminals of power relays and primary circuit of low voltage transformer). Beware of electric shock.

First of all operate the oven by following the operation procedures exactly in order to find the symptom.

9.1 (TROUBLE 1) Oven does not start

	SYMPTOMS	CAUSE	CORRECTIONS
1	Oven is dead. Fuse is OK. No display and no operation at all	1. Open or loose lead wire harness. 2. Open oven thermostat	Check fan motor when oven thermostat is defective.
		3. Open low voltage transformer. 4. Defective DPC.	
2	Oven does not accept key input (program).	1. Key input is not in sequence. 2. Open or loose connection of membrane keypad to DPC(Flat cable) 3. Shorted or open membrane keyboard.	Refer to operation procedure.
		4. Defective DPC.	Refer to DPC troubleshooting.
3.	Oven lamp and turntable motor turn on when oven is plugged in with door closed.	1. Misadjustment or loose wiring of secondary latch switch. 2. Defective secondary latch switch.	adjust door and latch switches.
4	Timer starts countdown but no microwave oscillation.	1. Off-alignment of latch switches. 2. Open primary latch switch. 3. Open or loose wiring of power relay 1 (RY1). 4. Defective power relay 1 (RY1). 5. Defective DPC. 6. Open or loose connection of high voltage circuit especially magnetron filament circuit. NOTE: Large contact resistance will bring lower magnetron filament voltage and cause magnetron to have lower output and/or be intermittent.	Adjust door and latch switches.
		7. Defecitive high voltage componet: NEW H.V. H.V.Transformer H.V. Capacitor H.V.Diode Magnetron	Check high voltage component according to component test procedure and replace if it is defective.

9.2 (TROUBLE 2) Fuse is blown

	SYMPTOMS	CAUSE	CORRECTIONS
1	Fuse is blown.	1. Shorted lead wire harness.	
		2. Defective short switch.	(NOTE 1)
		3. Defective primary latch switch	(NOTE 1)
		4. Shorted H.V. capacitor	
		5. Shorted H.V. diode.	Replace H.v. diode and HV Fuse (NOTE 2)
		6. Defective magnetron.	Replace magnetron and HV Fuse (NOTE 2)
		7. Shorted H.V. transformer.	Replace H.V. transformer and HV Fuse (NOTE 2)
		NOTE 1: If primary latch switch or short switch is found to be defective, please replace both of these switches. NOTE 2: Be sure to replace HV fuse together with those H.V. Components. In this case, only HV Fuse may be opened due to faulty H.V. Component. Therefore, if HV fuse is not replaced together, high voltage transformer will be damaged (overheated).	

9.3 (TROUBLE 3) Other troubles

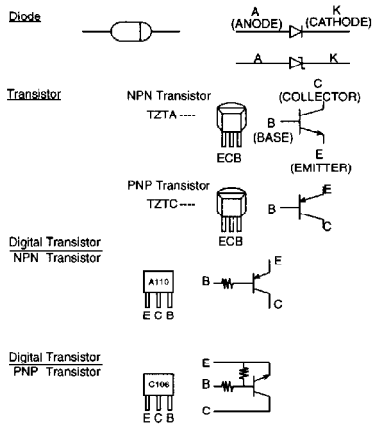
	SYMPTOMS	CAUSE	CORRECTIONS
1	Microwave output is low. Oven takes longer time to cook food.	1. Decrease in power source voltage.	Consult electrician.
		2. Open or loose wiring of magnetron filament circuit. (Intermittent oscillation) 3. Ageing change of magnetron.	
2	Turntable motor and oven lamp turn on when door is opened.	1. Shorted latch switches.	
3	Oven does not operate	1. Opened or loose wiring of oven thermostat. 2. Defective oven thermostat.	Check tighten screws on escutcheon base bracket, DPC board and oven thermostat.
		3. Defective DPC.	Refer to DPC troubleshooting.
4	Loud buzzing noise can be heard.	1. Loose fan and fan motor. 2. Loose screws on H.V. transformer.	
5	Oven stops operation during cooking.	1. Off-alignment of latch switches.	Adjust door and latch switches.
		2. Open or loose wiring of primary and secondary latch switch. 3. Operation of oven thermostat	
6	Turntable motor does not rotate.	1. Open or loose wiring of turntable motor. 2. Defective turntable motor.	

9.4 (TROUBLE 4) Trouble related to digital programmer circuit

SYMPTIOM	STEP	CHECK	RESULT	CAUSE/CORRECTIONS
No display when oven is first plugged in	1	Low voltage transfrmer (LVT) secondary voltage	Abnormal 0V	LVT
			Normal	→ Step 2
	2	IC-1 pin 42 voltage	Abnormal	VL 1
			Normal=5V	→ Step 3
	3	IC-1 pin 10 voltage (14 pin of IC-2).	Abnormal	ZD1, Q8
			Normal	→ IC-1, CR1,Q6,Q7 DISPLAY

SYMPTIOM	STEP	CHECK	RESULT	CAUSE/CORRECTIONS
No key input.	1	Membrane switch continuity.	Abnormal	Membrane switch
			Normal	IC-1
No beep sound.	1	IC-1 pin 34 voltage.	Abnormal	IC-1
			Normal	Q12, BZ1
Power relay A(RY-2) does not turn on even though the program has been set and the start pad is tapped.	1	IC-1 pin 40 voltage while operation.	Abnormal	IC-1
			Normal=5V	RY2, Q11, D4
No microwave oscillation at any power setting.	1	IC-1 pin 8 voltage while operation at high power.	Abnormal	IC-1
			Normal=5V	RY1, Q10, D3
No heating at grill or combination mode	1	IC-1 pin 38 voltage while operation at grill or combination mode.	Abnormal	IC-1
			Normal=5V	RY3, Q9,D2,J6
Dark or unclear display.	1	Replace display and check operation.	Normal	DISPLAY
			Abnormal	IC-1
Missing or lighting of unnecessary segment.	1	Q1~Q7 check operation.	Normal	→ Step 2
			Abnormal	Q1~Q7
	2	Replace IC-1 and check operation.	Normal	IC-1
			Abnormal	DISPLAY

How to check the semiconductors using an ohmmeter



	FORWARD	REVERSE
A-K	SMALL	∞

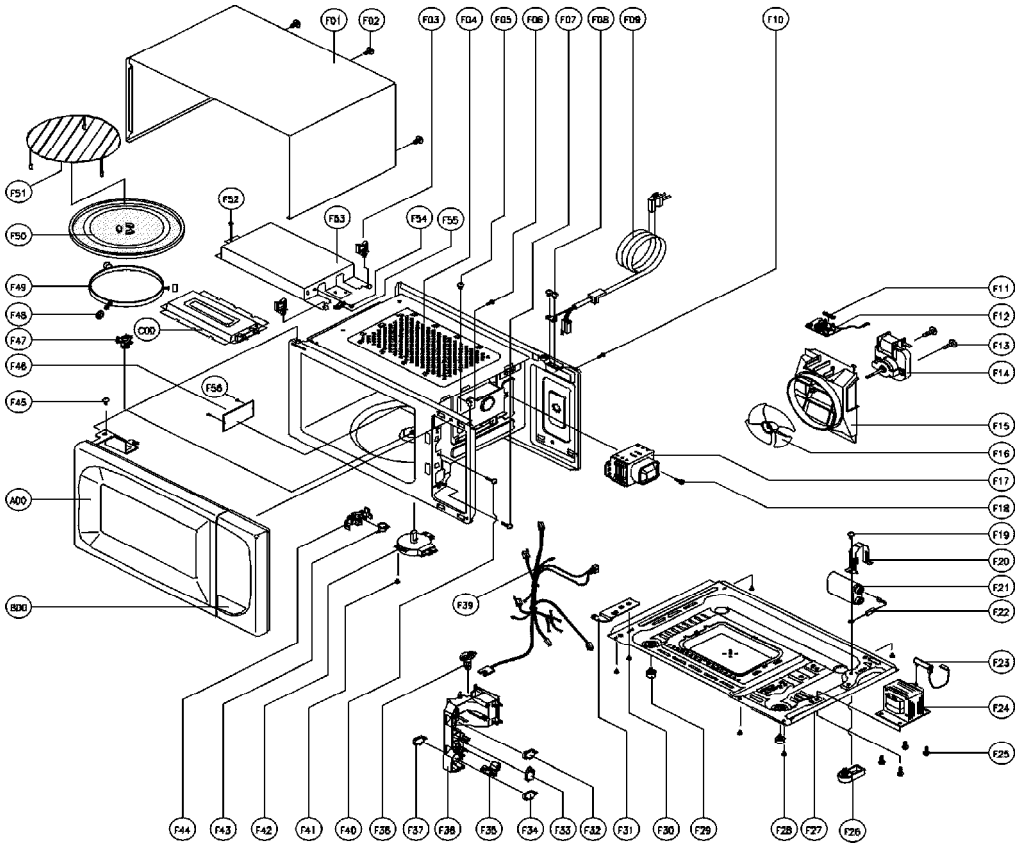
	FORWARD	REVERSE
B-E	SMALL	∞
B-C	SMALL	∞
C-E	∞	∞

	FORWARD	REVERSE
E-B	SMALL	∞
C-B	SMALL	∞
C-E	∞	∞

	FORWARD	REVERSE
E-B	SMALL	∞
C-B	SMALL	∞
C-E	∞	∞

	FORWARD	REVERSE
E-B	10KΩ-90KΩ	10KΩ-90KΩ
C-B	SMALL	∞
C-E	∞	SMALL

10. Main Exploded View

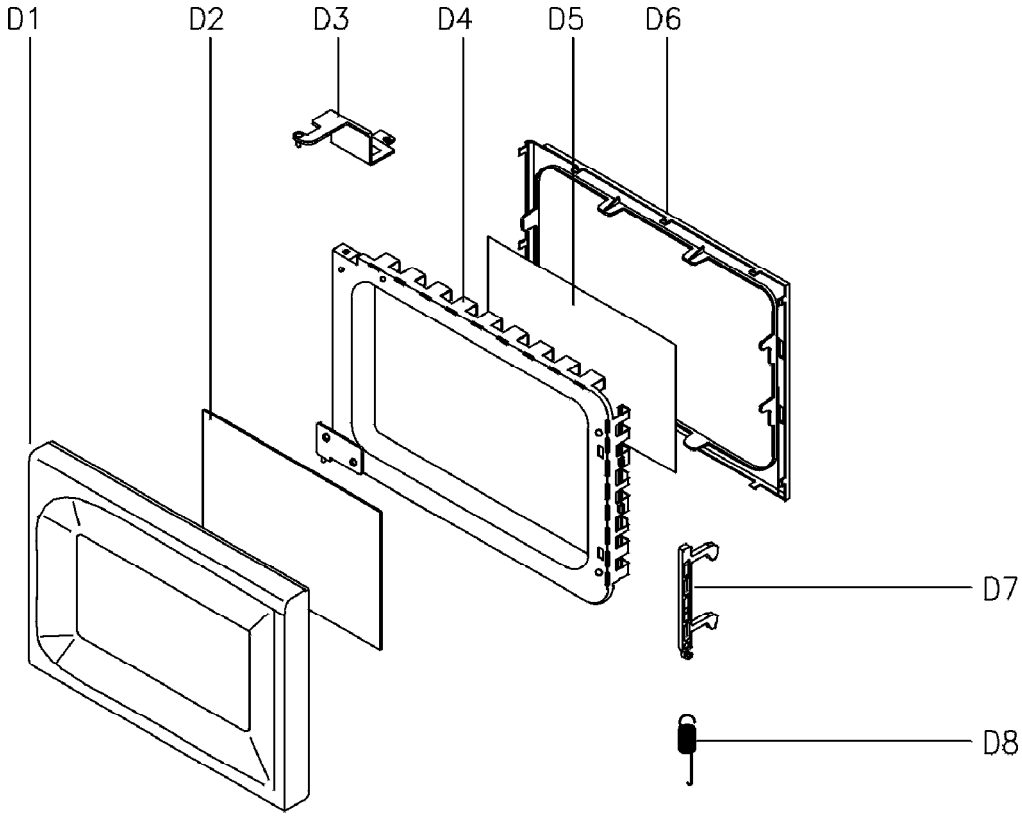


11. Main Parts List

Ref. No.		Part No.	Part Name & Description	Qty	Remarks
A00		3511715220	Door As	1	kor-63GP0S
B00	⚠	PKCPSWEP50	Control-panel As	1	kog-57gP0s
C00	⚠	3512803600	Heater *t As	1	kog-57350s
F01		3510803600	Cabinet Painting As	1	kor-61150s
F02		7112401011	Screw Tapping	3	t1 trs 4x10 Mfzn
F03		4413A90012	Clamp Power Cord	2	nylon 66
F04		3516111910	Cavity As	1	kog-57gp0s
F05		7112401011	Screw Tapping	1	t1s trs 4x10 mfzn
F06		7122401211	Screw Tapping	1	t2s trs 4x12 mfzn
F07		7122401211	Screw Tapping	1	t2s trs 4x12 mfzn
F08		7112401011	Screw Tapping	2	t1 trs 4x10 mfzn
F09	⚠	35113AAQPD	Cord Power As	1	3x1.5 80x80 100-rtml
F09	⚠	35113BEQ0F	Cord Power As	1	WPG ONLY
F10		7122401211	Screw Tapping	1	t2s trs 4*12 mfzn
F11	⚠	4415D67620	Fuse	1	250v 15a 65ts
	⚠	4415D67120	Fuse	1	250v 15a mda
F12	⚠	3518606100	Noise-filter	1	dwlf-m13
F13		7121403011	Screw Tapping	2	t2s pan 4x30 mfzn
F14	⚠	3963513100	Motor Shaded Pole	1	230v 17w oem-10dwc2-a07
	⚠	3963512310	Motor Shaded Pole	1	230v 20w mw10ca-m02
F15		3512517000	Guide Wind	1	pp

Ref. No.		Part No.	Part Name & Description	Qty	Remarks
F16		3511800300	Fan	1	pp+30%glass
F17	⚠	3518002400	Magnetron	1	2m218j (f)
F18		3516004000	Special Screw	1	t2 bolt flange 5x12 dacro
F19		7S422X4081	Screw Special	1	tt2 trs 4x8 se mfzn
F20		3513003200	Holder Hv Capacitor	1	secc t0.6
F21	⚠	3518302200	Capacitor Hv	1	2100vac 0.98? #187
F22	⚠	3518400900	Diode Hv As	1	hvr-1x-30r #187
	⚠	3518401000	Diode Hv As	1	esjc13-12bx #187
F23	⚠	3518701100	Fuse Hv	1	5kv 0.55a hv-41a55-02
F24	⚠	3518116820	Trans Hv	1	dw-n80s0-63t1
	⚠	3518116810	Trans Hv	1	jy-n80s0-63t1
F25		3516003700	Special Screw	4	tt3 hex 4x8 flg mfzn
F26		3511409300	Cover Screw	1	pp
F27		3510311700	Base	1	sbhg t0.7
F28		7112401011	Screw Tapping	5	t1 trs 4*10 mfzn
F29		3512100900	Foot	2	pp dasf-130
F30		7S422X4081	Screw Special	1	tt2 trs 4x8 se mfzn
F31		3515201101	Stopper Hinge *u	1	scp-1 t2.5
F32	⚠	5S752310G0	Sw Micro	1	szm-v15-fa-63
F33	⚠	5S752G10G0	Sw Micro	1	szm-v15-fa-61
F34	⚠	5S752310G0	Sw Micro	1	szm-v15-fa-63
F35		3513702600	Lever Lock	1	pom
F36		3513811700	Lock	1	pom black
F37	⚠	5S752310G0	Sw Micro	1	szm-v15-fa-63
F38	⚠	3513601600	Lamp	1	bl 240v 25w t25 c7a h187
F39	⚠	3512717630	Harness Main	1	kog-57gp0s
F40		7122401211	Screw Tapping	1	t2s trs 4x12 mfzn
F41		7112401011	Screw Tapping	1	t1 trs 4x10 mfzn
F42	⚠	3966310100	Motor Syncro	1	220v 2.5w gm-16-24fd12
F43	⚠	3518905300	Thermostat	1	off:75 on:65 H #187 NB
F44		3513003400	Holder Thermostat	1	pbt
F45		3516003700	Special Screw	1	tt3 hex 4x8 flg mfzn
F46		3511405100	Cover Wave Guide	1	mica t0.35
F47		3517400620	Coupler	1	xarec
F48		3514700710	Roller	3	teflon
F49		3512517300	Guide Roller	1	pp 5113mf6 a353b
F50		3517203600	Tray	1	glass
F51		3517208000	Tray Rack As	1	kog-57gp0s
F52		7112401011	Screw Tapping	1	T1 TRS 4X10 MFZN
F53		3511408200	Cover Insulator *t	1	SBHG T0.5
F54		7112401011	Screw Tapping	1	T1 TRS 4X10 MFZN
F55	⚠	3518905900	Thermostat	1	75/65 V #187
F56		4414H50000	Fixture As	2	kog-36150s

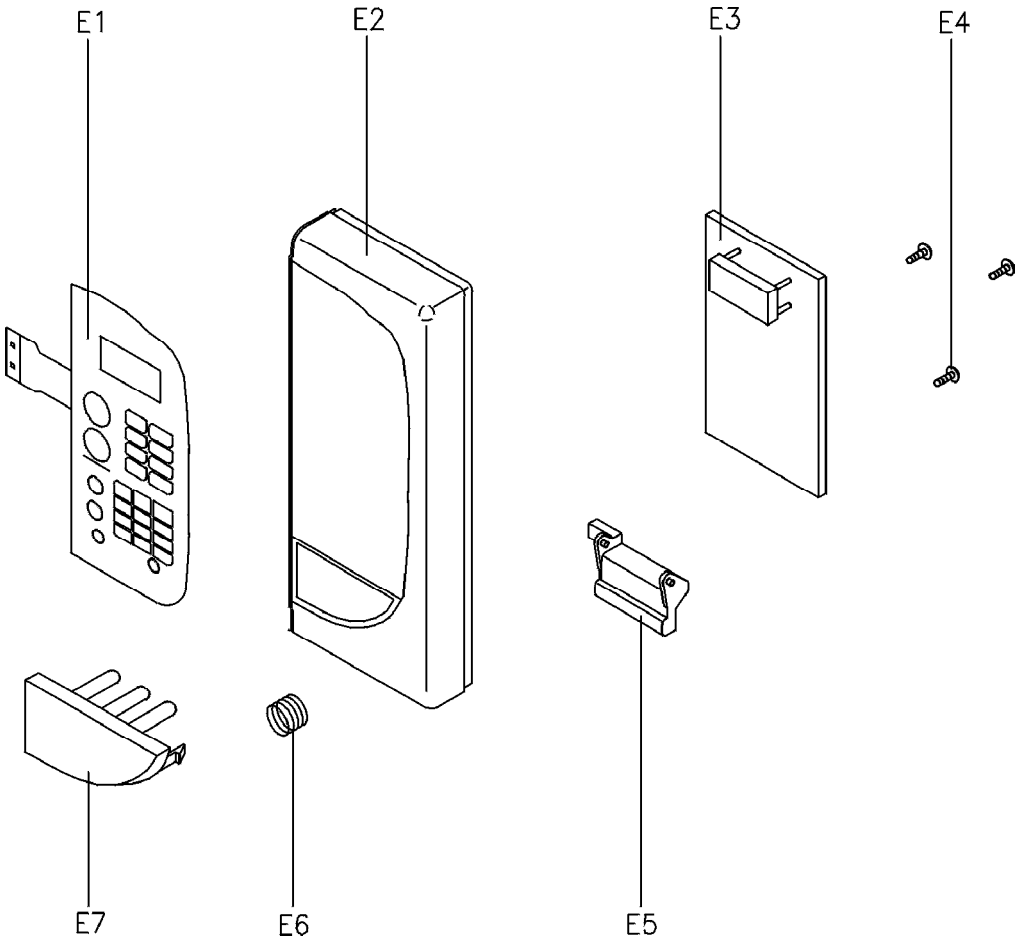
12. Door Assembly



Ref. No.		Part No.	Part Name & Description	Qty	Remarks
D1		3512205210	FRAME DOOR (door a)	1	
D2		3517007300	BARRIER-SCREEN *O (screen b)	1	
D3		3515204100	STOPPER HINGE *T AS	1	
D4		3511706100	DOOR PAINTING AS (door e)	1	
D5		3517002800	BARRIER-SCREEN *I	1	
D6		3512300200	GASKET DOOR (door c)	1	
D7		3513100700	HOOk (door key)	1	
D8		3515101300	SPRING HOOK (door key spring)	1	

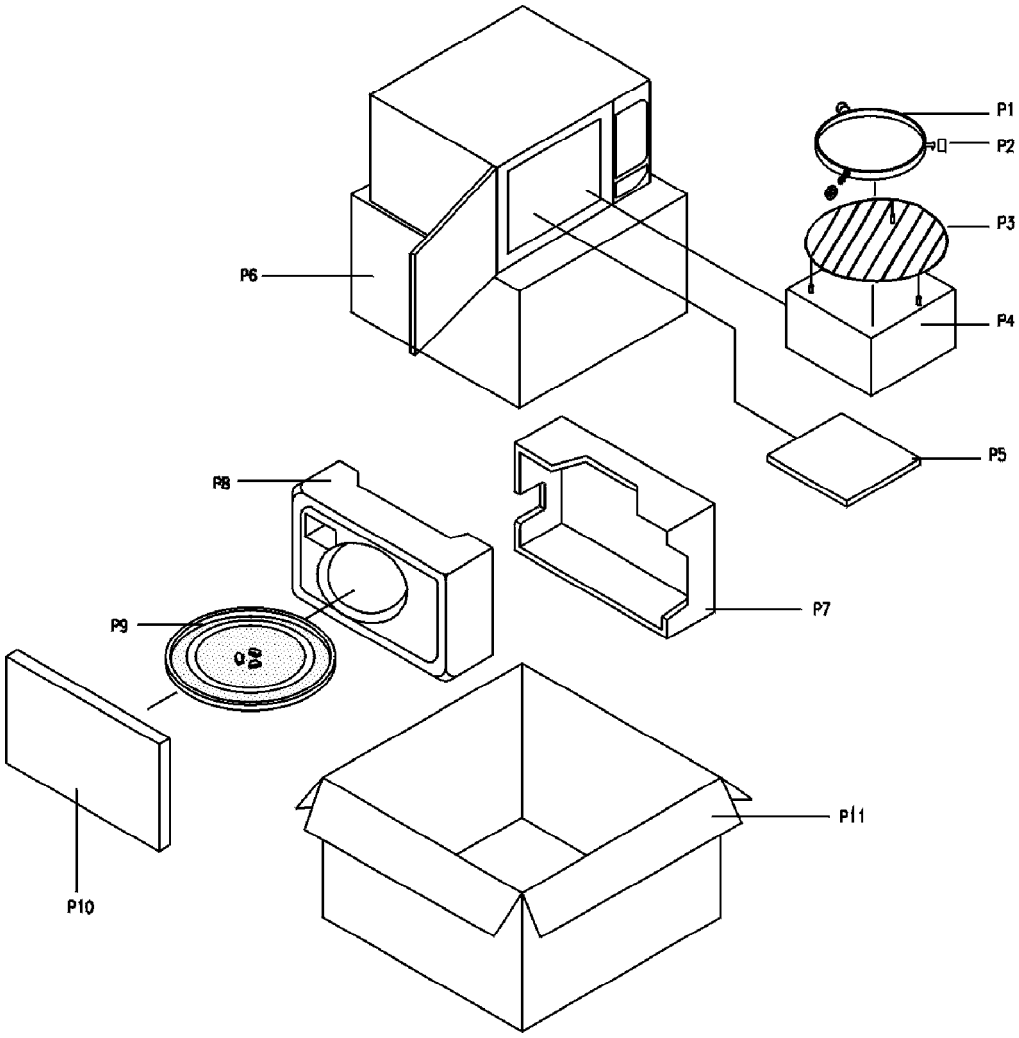
NOTE: When ordering any door components also order door C as this may become damaged during assembly.

13. Escutcheon Base Assembly



Ref. No.		Part No.	Part Name & Description	Qty	Remarks
E1	⚠	3518522910	SWITCH MEMBRANE	1	
E2	⚠	3516725380	CONTROL-PANEL(ESCUTCHEON BASE)	1	
E3	⚠	3514322470	PCB MAIN MANUAL AS	1	
E4		7122401211	SCREW TAPPING	4	
E5		3513702700	LEVER DOOR OPEN	1	
E6		441G430171	SPRING BUTTON	1	
E7		3516906960	BUTTON DOOR OPEN	1	

14. Packing and Accessories



Ref. No.		Part No.	Part Name & Description	Qty	Remarks
P1		3512517300	GUIDE ROLLER	1	
P2		3514700710	ROLLER	3	
P3		3517208000	TRAY RACK	1	
P4		3510200510	BAG TRAY RACK	1	
P5		4413A700C1	MANUAL INSTRUCTION	1	EPG ONLY
P5		4413A700C2	MANUAL INSTRUCTION	1	GPG ONLY
P5		4413A700C3	MANUAL INSTRUCTION	1	WPG ONLY
P6		3510202010	BAG SET	1	
P7		3511505401	CUSHION *L	1	
P8		3511505301	CUSHION *R	1	
P9		3517203600	TRAY	1	
P10		3514101400	PAD TRAY	1	
P11		3510504700	BOX SET	1	

15. Digital Programmer Circuit Parts List

Ref. No.		Part No.	Part Name & Description	Qty	Remarks
BZ1		3515600100	BUZZER	1	BM-20K
CA1		CN5XB-102M	C ARRAY	1	6P(5) 1000PF M 50V
EC1		CEXF1C101V	CAPACITOR ELEC	1	RSS 100MF 16V
EC2		CEXF1E102V	CAPACITOR ELEC	1	25V RSS 1000MF
CN1		3519150520	CONNECTOR WAFER	1	YW396-02V
CN2		441M367150	CONNECTOR FILM	1	FCZ 254-10P
CN3		3519150510	CONNECTOR WAFER	1	YW396-05AV
D1~D7		DZN4148---	DIODE RECTIFY	7	1N4148
D8,D9		DZN4004A--	DIODE RECTIFY	2	KN4004A
ZD1		DZUZ3R3BSB	DIODE ZENER	1	UZ- 3.3BSB 1/2W
ZD2		DZUZ5R1BSB	DIODE ZENER	1	UZ- 5.1BSB 1/2W
M173		3514321160	PCB MAIN	1	81.5X139.9
RA1		RA-86X104J	R ARRAY	1	6P(5) 1/8 100K J
R1~8		RD-AZ331J-	RESISTER	8	1/6W 330 5%
R10, 11, 13, 22		RD-AZ102J-	RESISTER	4	1/6W 1K 5%
R9,17,18		RD-AZ104J-	RESISTER	3	1/6W 100K 5%
R14		RD-AZ101J-	RESISTER	1	1/6W 100 5%
R12, 15, 20		RD-AZ103J-	RESISTER	3	1/6W 10K 5%
R16		RD-AZ105J-	RESISTER	1	1/6W 1M 5%
R19		RD-AZ472J-	RESISTER	1	1/6W 4.7K 5%
R21		RD-4Z510J-	RESISTER	1	1/4W 51 5%
CR1		5P4R00MTS-	RESONATOR CERA	1	CRT 4.00MS
VL1		1CPMC7805C	IC REGULATOR	1	MC7805C
Q1~5		TZRA110M--	TRANSISTOR	5	KRA-110M
Q6, 7, 9~12		TZRC106M--	TRANSISTOR	6	KRC-106M
Q8		TZTA1266Y-	TRANSISTOR	1	KTA-1266Y
LVT	⚠	5EPV035303	TRANS POWER	1	DMR-631FS
J1~8 ,10, 11		85801052GY	WIRE COPPER	10	1/0.52 TIN COATING(7.5mm)
J9		85801052GY	WIRE COPPER	1	1/0.52 TIN COATING(12.5mm)
SJ1		85801052GY	WIRE COPPER	1	1/0.52 TIN COATING(7.5mm)
IC1	⚠	147S57GP00	IC MICOM	1	HD404054A75S
RY1, RY3		5SC0101121	SW RELAY	2	G5G-1A DC12V
RY2		5SC0101404	SW RELAY	1	OJ-SS-112LM
C2~6		CCZF1H104Z	CAPACITOR CERA	5	50V HIKF 0.1MF Z
C1		CCZF1H473Z	CAPACITOR CERA	1	50V 4700PF
DP1		DELF316GWB	LED DISPLAY	1	ELF-316GWB-07